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## SEQUENCE LISTING

<110> Mizzen, Lee A.  
Hongwei, Liu  
Siegel, Marvin

<120> HEPATITIS B VIRUS TREATMENT

<130> 12071-017002

<140> US 10/068,059

<141> 2002-02-05

<150> US 60/266,733

<151> 2001-02-05

<160> 12

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 558

<212> DNA

<213> Hepatitis B virus

<220>

<221> CDS

<222> (1)...(555)

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Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp	
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acc gcc tca gct ctg tat cgg gaa gcc tta gag tct cct gag cat tgc	144
Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys	
35 40 45	

tca cct cac cac acc gca ctc agg caa gcc att ctc tgc tgg ggg gaa	192
Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu	
50 55 60	

ttg atg act cta gct acc tgg gtg ggt aat aat ttg gaa gat cca gca	240
Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala	
65 70 75 80	

tca agg gat cta gta gtc aat tat gtt aat act aac atg ggt tta aaa	288
Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys	
85 90 95	

att agg caa cta ttg tgg ttt cat ata tct tgc ctt act ttt gga aga	336
Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg	
100 105 110	

gag act gta ctt gaa tat ttg gta tct ttc gga gtg tgg att cgc act 384  
 Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr  
 115 120 125

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 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro  
 130 135 140

gaa act act gtt gtt aga cga cgg gac cga ggc agg tcc cct aga aga 480  
 Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg  
 145 150 155 160

aga act ccc tcg cct cgc aga cgc aga tct caa tcg ccg cgt cgc aga 528  
 Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg  
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 180 185

<210> 2

<211> 185

<212> PRT

<213> Hepatitis B virus

<400> 2

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 Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys  
 35 40 45  
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu  
 50 55 60  
 Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala  
 65 70 75 80  
 Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys  
 85 90 95  
 Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg  
 100 105 110  
 Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr  
 115 120 125  
 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro  
 130 135 140  
 Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg  
 145 150 155 160  
 Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg  
 165 170 175  
 Arg Ser Gln Ser Arg Glu Ser Gln Cys  
 180 185

<210> 3

<211> 513

<212> DNA

<213> Artificial Sequence

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&lt;221&gt; CDS

&lt;222&gt; (1)...(510)

&lt;223&gt; Nucleic acids encoding fusion protein

&lt;400&gt; 3

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cgc	ggc	agc	cat	atg	gac	att	gac	cct	tat	aaa	gaa	ttt	gga	gct	act	96
Arg	Gly	Ser	His	Met	Asp	Ile	Asp	Pro	Tyr	Lys	Glu	Phe	Gly	Ala	Thr	
			20					25					30			

gtg	gag	tta	ctc	tcg	ttt	ttg	cct	tct	gac	ttc	ttt	cct	tcc	gtc	aga	144
Val	Glu	Leu	Leu	Ser	Phe	Leu	Pro	Ser	Asp	Phe	Phe	Pro	Ser	Val	Arg	
		35					40					45				

gat	ctc	cta	gac	acc	gcc	tca	gct	ctg	tat	cgg	gaa	gcc	tta	gag	tct	192
Asp	Leu	Leu	Asp	Thr	Ala	Ser	Ala	Leu	Tyr	Arg	Glu	Ala	Leu	Glu	Ser	
	50					55					60					

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Pro	Glu	His	Cys	Ser	Pro	His	His	Thr	Ala	Leu	Arg	Gln	Ala	Ile	Leu	
65					70					75					80	

tgc	tgg	ggg	gaa	ttg	atg	act	cta	gct	acc	tgg	gtg	ggg	aat	aat	ttg	288
Cys	Trp	Gly	Glu	Leu	Met	Thr	Leu	Ala	Thr	Trp	Val	Gly	Asn	Asn	Leu	
				85					90					95		

gaa	gat	cca	gca	tca	agg	gat	cta	gta	gtc	agt	tat	gtt	aat	act	aac	336
Glu	Asp	Pro	Ala	Ser	Arg	Asp	Leu	Val	Val	Ser	Tyr	Val	Asn	Thr	Asn	
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atg	ggg	tta	aaa	ttt	agg	caa	cta	ttg	tgg	ttt	cat	ata	tct	tgc	ctt	384
Met	Gly	Leu	Lys	Phe	Arg	Gln	Leu	Leu	Trp	Phe	His	Ile	Ser	Cys	Leu	
		115					120					125				

act	ttt	gga	aga	gag	act	gta	ctt	gaa	tat	ttg	gta	tct	ttc	gga	gtg	432
Thr	Phe	Gly	Arg	Glu	Thr	Val	Leu	Glu	Tyr	Leu	Val	Ser	Phe	Gly	Val	
	130					135					140					

tgg	att	cgc	act	cct	cca	gcc	tat	aga	cca	cca	aat	gcc	cct	atc	tta	480
Trp	Ile	Arg	Thr	Pro	Pro	Ala	Tyr	Arg	Pro	Pro	Asn	Ala	Pro	Ile	Leu	
145					150					155					160	

tca	aca	ctt	ccg	gaa	act	act	gtt	gtt	aac	tga						513
Ser	Thr	Leu	Pro	Glu	Thr	Thr	Val	Val	Asn							
				165					170							

&lt;210&gt; 4

&lt;211&gt; 170

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Fusion protein

&lt;400&gt; 4

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Met Gly Ser Ser His His His His His Ser Ser Gly Leu Val Pro
 1           5           10           15
Arg Gly Ser His Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr
          20           25           30
Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg
          35           40           45
Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser
          50           55           60
Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu
          65           70           75           80
Cys Trp Gly Glu Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu
          85           90           95
Glu Asp Pro Ala Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn
          100          105          110
Met Gly Leu Lys Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu
          115          120          125
Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val
          130          135          140
Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu
          145          150          155          160
Ser Thr Leu Pro Glu Thr Thr Val Val Asn
          165          170

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&lt;210&gt; 5

&lt;211&gt; 2241

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)...(2238)

&lt;223&gt; Nucleic acids encoding fusion protein

&lt;400&gt; 5

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atg ggc agc agc cat cat cat cat cat cac agc agc ggc ctg gtg ccg      48
Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro
 1           5           10           15

cgc ggc agc cat atg gac att gac cct tat aaa gaa ttt gga gct act      96
Arg Gly Ser His Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr
          20           25           30

gtg gag tta ctc tcg ttt ttg cct tct gac ttc ttt cct tcc gtc aga      144
Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg
          35           40           45

gat ctc cta gac acc gcc tca gct ctg tat cgg gaa gcc tta gag tct      192
Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser
          50           55           60

cct gag cat tgc tca cct cac cac acc gca ctc agg caa gcc att ctc      240
Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu
          65           70           75           80

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tgc tgg ggg gaa ttg atg act cta gct acc tgg gtg ggt aat aat ttg Cys Trp Gly Glu Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu	288
85 90 95	
gaa gat cca gca tca agg gat cta gta gtc aat tat gtt aat act aac Glu Asp Pro Ala Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn	336
100 105 110	
atg ggt tta aaa ttt agg caa cta ttg tgg ttt cat ata tct tgc ctt Met Gly Leu Lys Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu	384
115 120 125	
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130 135 140	
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145 150 155 160	
tca aca ctt ccg gaa act act gtt gtt aga cga cgg gac cga ggc agg Ser Thr Leu Pro Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg	528
165 170 175	
tcc cct aga aga aga act ccc tcg cct cgc aga cgc aga tct caa tcg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Ser Gln Ser	576
180 185 190	
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195 200 205	
aag aca att gcg tac gac gaa gag gcc cgt cgc ggc ctc gag cgg ggc Lys Thr Ile Ala Tyr Asp Glu Glu Ala Arg Arg Gly Leu Glu Arg Gly	672
210 215 220	
ttg aac gcc ctc gcc gat gcg gta aag gtg aca ttg ggc ccc aag ggc Leu Asn Ala Leu Ala Asp Ala Val Lys Val Thr Leu Gly Pro Lys Gly	720
225 230 235 240	
cgc aac gtc gtc ctg gaa aag aag tgg ggt gcc ccc acg atc acc aac Arg Asn Val Val Leu Glu Lys Lys Trp Gly Ala Pro Thr Ile Thr Asn	768
245 250 255	
gat ggt gtg tcc atc gcc aag gag atc gag ctg gag gat ccg tac gag Asp Gly Val Ser Ile Ala Lys Glu Ile Glu Leu Glu Asp Pro Tyr Glu	816
260 265 270	
aag atc ggc gcc gag ctg gtc aaa gag gta gcc aag aag acc gat gac Lys Ile Gly Ala Glu Leu Val Lys Glu Val Ala Lys Lys Thr Asp Asp	864
275 280 285	
gtc gcc ggt gac ggc acc acg acg gcc acc gtg ctg gcc cag gcg ttg Val Ala Gly Asp Gly Thr Thr Thr Ala Thr Val Leu Ala Gln Ala Leu	912
290 295 300	

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ctc aaa cgc ggc atc gaa aag gcc gtg gag aag gtc acc gac acc ctg Leu Lys Arg Gly Ile Glu Lys Ala Val Glu Lys Val Thr Asp Thr Leu 325 330 335	1008
ctc aag ggc gcc aag gag gtc gag acc aag gag cag att gcg gcc acc Leu Lys Gly Ala Lys Glu Val Glu Thr Lys Glu Gln Ile Ala Ala Thr 340 345 350	1056
gca gcg att tcg gcg ggt gac cag tcc atc ggt gac ctg atc gcc gag Ala Ala Ile Ser Ala Gly Asp Gln Ser Ile Gly Asp Leu Ile Ala Glu 355 360 365	1104
gcg atg gac aag gtg ggc aac gag ggc gtc atc acc gtc gag gag tcc Ala Met Asp Lys Val Gly Asn Glu Gly Val Ile Thr Val Glu Glu Ser 370 375 380	1152
aac acc ttt ggg ctg cag ctc gag ctc acc gag ggt atg ccg ttc gac Asn Thr Phe Gly Leu Gln Leu Glu Leu Thr Glu Gly Met Arg Phe Asp 385 390 395 400	1200
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gcg gtc ctg gag gac ccc tac atc ctg ctg gtc agc tcc aag gtg tcc Ala Val Leu Glu Asp Pro Tyr Ile Leu Leu Val Ser Ser Lys Val Ser 420 425 430	1296
act gtc aag gat ctg ctg ccg ctg ctc gag aag gtc atc gga gcc ggt Thr Val Lys Asp Leu Leu Pro Leu Leu Glu Lys Val Ile Gly Ala Gly 435 440 445	1344
aag ccg ctg ctg atc atc gcc gag gac gtc gag ggc gag gcg ctg tcc Lys Pro Leu Leu Ile Ile Ala Glu Asp Val Glu Gly Glu Ala Leu Ser 450 455 460	1392
acc ctg gtc gtc aac aag atc cgc ggc acc ttc aag tcg gtg gcg gtc Thr Leu Val Val Asn Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val 465 470 475 480	1440
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gcc att ctc acc ggt ggt cag gtg atc agc gaa gag gtc ggc ctg acg Ala Ile Leu Thr Gly Gly Gln Val Ile Ser Glu Glu Val Gly Leu Thr 500 505 510	1536
ctg gag aac gcc gac ctg tcg ctg cta ggc aag gcc cgc aag gtc gtg Leu Glu Asn Ala Asp Leu Ser Leu Leu Gly Lys Ala Arg Lys Val Val 515 520 525	1584

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gcc atc gcc gga cga gtg gcc cag atc cgc cag gag atc gag aac agc Ala Ile Ala Gly Arg Val Ala Gln Ile Arg Gln Glu Ile Glu Asn Ser 545 550 555 560	1680
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gcc ggt ggt gtc gcg gtg atc aag gcc ggt gcc gcc acc gag gtc gaa Ala Gly Gly Val Ala Val Ile Lys Ala Gly Ala Ala Thr Glu Val Glu 580 585 590	1776
ctc aag gag cgc aag cac cgc atc gag gat gcg gtt cgc aat gcc aag Leu Lys Glu Arg Lys His Arg Ile Glu Asp Ala Val Arg Asn Ala Lys 595 600 605	1824
gcc gcc gtc gag gag ggc atc gtc gcc ggt ggg ggt gtg acg ctg ttg Ala Ala Val Glu Glu Gly Ile Val Ala Gly Gly Gly Val Thr Leu Leu 610 615 620	1872
caa gcg gcc ccg acc ctg gac gag ctg aag ctc gaa ggc gac gag gcg Gln Ala Ala Pro Thr Leu Asp Glu Leu Lys Leu Glu Gly Asp Glu Ala 625 630 635 640	1920
acc gcc gcc aac atc gtg aag gtg gcg ctg gag gcc ccg ctg aag cag Thr Gly Ala Asn Ile Val Lys Val Ala Leu Glu Ala Pro Leu Lys Gln 645 650 655	1968
atc gcc ttc aac tcc ggg ctg gag ccg gcc gtg gtg gcc gag aag gtg Ile Ala Phe Asn Ser Gly Leu Glu Pro Gly Val Val Ala Glu Lys Val 660 665 670	2016
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tcg gcg ctg cag aat gcg gcg tcc atc gcg ggg ctg ttc ctg acc acc Ser Ala Leu Gln Asn Ala Ala Ser Ile Ala Gly Leu Phe Leu Thr Thr 705 710 715 720	2160
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 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Fusion protein

<400> 6

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Val	Glu	Leu	Leu	Ser	Phe	Leu	Pro	Ser	Asp	Phe	Phe	Pro	Ser	Val	Arg	35	40	45	
Asp	Leu	Leu	Asp	Thr	Ala	Ser	Ala	Leu	Tyr	Arg	Glu	Ala	Leu	Glu	Ser	50	55	60	
Pro	Glu	His	Cys	Ser	Pro	His	His	Thr	Ala	Leu	Arg	Gln	Ala	Ile	Leu	65	70	75	80
Cys	Trp	Gly	Glu	Leu	Met	Thr	Leu	Ala	Thr	Trp	Val	Gly	Asn	Asn	Leu	85	90	95	
Glu	Asp	Pro	Ala	Ser	Arg	Asp	Leu	Val	Val	Asn	Tyr	Val	Asn	Thr	Asn	100	105	110	
Met	Gly	Leu	Lys	Phe	Arg	Gln	Leu	Leu	Trp	Phe	His	Ile	Ser	Cys	Leu	115	120	125	
Thr	Phe	Gly	Arg	Glu	Thr	Val	Leu	Glu	Tyr	Leu	Val	Ser	Phe	Gly	Val	130	135	140	
Trp	Ile	Arg	Thr	Pro	Pro	Ala	Tyr	Arg	Pro	Pro	Asn	Ala	Pro	Ile	Leu	145	150	155	160
Ser	Thr	Leu	Pro	Glu	Thr	Thr	Val	Val	Arg	Arg	Arg	Asp	Arg	Gly	Arg	165	170	175	
Ser	Pro	Arg	Arg	Arg	Thr	Pro	Ser	Pro	Arg	Arg	Arg	Arg	Ser	Gln	Ser	180	185	190	
Pro	Arg	Arg	Arg	Arg	Ser	Gln	Ser	Arg	Glu	Ser	Gln	Cys	Val	Asn	Ala	195	200	205	
Lys	Thr	Ile	Ala	Tyr	Asp	Glu	Glu	Ala	Arg	Arg	Gly	Leu	Glu	Arg	Gly	210	215	220	
Leu	Asn	Ala	Leu	Ala	Asp	Ala	Val	Lys	Val	Thr	Leu	Gly	Pro	Lys	Gly	225	230	235	240
Arg	Asn	Val	Val	Leu	Glu	Lys	Lys	Trp	Gly	Ala	Pro	Thr	Ile	Thr	Asn	245	250	255	
Asp	Gly	Val	Ser	Ile	Ala	Lys	Glu	Ile	Glu	Leu	Glu	Asp	Pro	Tyr	Glu	260	265	270	
Lys	Ile	Gly	Ala	Glu	Leu	Val	Lys	Glu	Val	Ala	Lys	Lys	Thr	Asp	Asp	275	280	285	
Val	Ala	Gly	Asp	Gly	Thr	Thr	Thr	Ala	Thr	Val	Leu	Ala	Gln	Ala	Leu	290	295	300	
Val	Arg	Glu	Gly	Leu	Arg	Asn	Val	Ala	Ala	Gly	Ala	Asn	Pro	Leu	Gly	305	310	315	320
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Leu	Lys	Gly	Ala	Lys	Glu	Val	Glu	Thr	Lys	Glu	Gln	Ile	Ala	Ala	Thr	340	345	350	
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Ala	Met	Asp	Lys	Val	Gly	Asn	Glu	Gly	Val	Ile	Thr	Val	Glu	Glu	Ser	370	375	380	

Asn	Thr	Phe	Gly	Leu	Gln	Leu	Glu	Leu	Thr	Glu	Gly	Met	Arg	Phe	Asp	385	390	395	400
Lys	Gly	Tyr	Ile	Ser	Gly	Tyr	Phe	Val	Thr	Asp	Pro	Glu	Arg	Gln	Glu		405	410	415
Ala	Val	Leu	Glu	Asp	Pro	Tyr	Ile	Leu	Leu	Val	Ser	Ser	Lys	Val	Ser		420	425	430
Thr	Val	Lys	Asp	Leu	Leu	Pro	Leu	Leu	Glu	Lys	Val	Ile	Gly	Ala	Gly		435	440	445
Lys	Pro	Leu	Leu	Ile	Ile	Ala	Glu	Asp	Val	Glu	Gly	Glu	Ala	Leu	Ser		450	455	460
Thr	Leu	Val	Val	Asn	Lys	Ile	Arg	Gly	Thr	Phe	Lys	Ser	Val	Ala	Val		465	470	475
Lys	Ala	Pro	Gly	Phe	Gly	Asp	Arg	Arg	Lys	Ala	Met	Leu	Gln	Asp	Met		485	490	495
Ala	Ile	Leu	Thr	Gly	Gly	Gln	Val	Ile	Ser	Glu	Glu	Val	Gly	Leu	Thr		500	505	510
Leu	Glu	Asn	Ala	Asp	Leu	Ser	Leu	Leu	Gly	Lys	Ala	Arg	Lys	Val	Val		515	520	525
Val	Thr	Lys	Asp	Glu	Thr	Thr	Ile	Val	Glu	Gly	Ala	Gly	Asp	Thr	Asp		530	535	540
Ala	Ile	Ala	Gly	Arg	Val	Ala	Gln	Ile	Arg	Gln	Glu	Ile	Glu	Asn	Ser		545	550	555
Asp	Ser	Asp	Tyr	Asp	Arg	Glu	Lys	Leu	Gln	Glu	Arg	Leu	Ala	Lys	Leu		565	570	575
Ala	Gly	Gly	Val	Ala	Val	Ile	Lys	Ala	Gly	Ala	Ala	Thr	Glu	Val	Glu		580	585	590
Leu	Lys	Glu	Arg	Lys	His	Arg	Ile	Glu	Asp	Ala	Val	Arg	Asn	Ala	Lys		595	600	605
Ala	Ala	Val	Glu	Glu	Gly	Ile	Val	Ala	Gly	Gly	Gly	Val	Thr	Leu	Leu		610	615	620
Gln	Ala	Ala	Pro	Thr	Leu	Asp	Glu	Leu	Lys	Leu	Glu	Gly	Asp	Glu	Ala		625	630	635
Thr	Gly	Ala	Asn	Ile	Val	Lys	Val	Ala	Leu	Glu	Ala	Pro	Leu	Lys	Gln		645	650	655
Ile	Ala	Phe	Asn	Ser	Gly	Leu	Glu	Pro	Gly	Val	Val	Ala	Glu	Lys	Val		660	665	670
Arg	Asn	Leu	Pro	Ala	Gly	His	Gly	Leu	Asn	Ala	Gln	Thr	Gly	Val	Tyr		675	680	685
Glu	Asp	Leu	Leu	Ala	Ala	Gly	Val	Ala	Asp	Pro	Val	Lys	Val	Thr	Arg		690	695	700
Ser	Ala	Leu	Gln	Asn	Ala	Ala	Ser	Ile	Ala	Gly	Leu	Phe	Leu	Thr	Thr		705	710	715
Glu	Ala	Val	Val	Ala	Asp	Lys	Pro	Glu	Lys	Glu	Lys	Ala	Ser	Val	Pro		725	730	735
Gly	Gly	Gly	Asp	Met	Gly	Gly	Met	Asp	Phe								740	745	

&lt;210&gt; 7

&lt;211&gt; 2130

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)...(2127)

&lt;223&gt; Nucleic acids encoding fusion protein

&lt;400&gt; 7

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Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro	
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cgc ggc agc cat atg gac att gac cct tat aaa gaa ttt gga gct act	96
Arg Gly Ser His Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr	
20 25 30	
gtg gag tta ctc tcg ttt ttg cct tct gac ttc ttt cct tcc gtc aga	144
Val Glu Leu Leu Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg	
35 40 45	
gat ctc cta gac acc gcc tca gct ctg tat cgg gaa gcc tta gag tct	192
Asp Leu Leu Asp Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser	
50 55 60	
cct gag cat tgc tca cct cac cac acc gca ctc agg caa gcc att ctc	240
Pro Glu His Cys Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu	
65 70 75 80	
tgc tgg ggg gaa ttg atg act cta gct acc tgg gtg ggt aat aat ttg	288
Cys Trp Gly Glu Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu	
85 90 95	
gaa gat cca gca tca agg gat cta gta gtc agt tat gtt aat act aac	336
Glu Asp Pro Ala Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn	
100 105 110	
atg ggt tta aaa ttt agg caa cta ttg tgg ttt cat ata tct tgc ctt	384
Met Gly Leu Lys Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu	
115 120 125	
act ttt gga aga gag act gta ctt gaa tat ttg gta tct ttc gga gtg	432
Thr Phe Gly Arg Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val	
130 135 140	
tgg att cgc act cct cca gcc tat aga cca cca aat gcc cct atc tta	480
Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu	
145 150 155 160	
tca aca ctt ccg gaa act act gtt gtt aac gcc aag aca att gcg tac	528
Ser Thr Leu Pro Glu Thr Thr Val Val Asn Ala Lys Thr Ile Ala Tyr	
165 170 175	
gac gaa gag gcc cgt cgc ggc ctc gag cgg ggc ttg aac gcc ctc gcc	576
Asp Glu Glu Ala Arg Arg Gly Leu Glu Arg Gly Leu Asn Ala Leu Ala	
180 185 190	
gat gcg gta aag gtg aca ttg ggc ccc aag ggc cgc aac gtc gtc ctg	624
Asp Ala Val Lys Val Thr Leu Gly Pro Lys Gly Arg Asn Val Val Leu	
195 200 205	
gaa aag aag tgg ggt gcc ccc acg atc acc aac gat ggt gtg tcc atc	672
Glu Lys Lys Trp Gly Ala Pro Thr Ile Thr Asn Asp Gly Val Ser Ile	
210 215 220	

gcc aag gag atc gag ctg gag gat ccg tac gag aag atc ggc gcc gag Ala Lys Glu Ile Glu Leu Glu Asp Pro Tyr Glu Lys Ile Gly Ala Glu 225 230 235 240	720
ctg gtc aaa gag gta gcc aag aag acc gat gac gtc gcc ggt gac ggc Leu Val Lys Glu Val Ala Lys Lys Thr Asp Asp Val Ala Gly Asp Gly 245 250 255	768
acc acg acg gcc acc gtg ctg gcc cag gcg ttg gtt cgc gag ggc ctg Thr Thr Thr Ala Thr Val Leu Ala Gln Ala Leu Val Arg Glu Gly Leu 260 265 270	816
cgc aac gtc gcg gcc ggc gcc aac ccg ctc ggt ctc aaa cgc ggc atc Arg Asn Val Ala Ala Gly Ala Asn Pro Leu Gly Leu Lys Arg Gly Ile 275 280 285	864
gaa aag gcc gtg gag aag gtc acc gag acc ctg ctc aag ggc gcc aag Glu Lys Ala Val Glu Lys Val Thr Glu Thr Leu Leu Lys Gly Ala Lys 290 295 300	912
gag gtc gag acc aag gag cag att gcg gcc acc gca gcg att tcg gcg Glu Val Glu Thr Lys Glu Gln Ile Ala Ala Thr Ala Ala Ile Ser Ala 305 310 315 320	960
ggt gac cag tcc atc ggt gac ctg atc gcc gag gcg atg gac aag gtg Gly Asp Gln Ser Ile Gly Asp Leu Ile Ala Glu Ala Met Asp Lys Val 325 330 335	1008
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cag ctc gag ctc acc gag ggt atg ccg ttc gac aag ggc tac atc tcg Gln Leu Glu Leu Thr Glu Gly Met Arg Phe Asp Lys Gly Tyr Ile Ser 355 360 365	1104
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ccc tac atc ctg ctg gtc agc tcc aag gtg tcc act gtc aag gat ctg Pro Tyr Ile Leu Leu Val Ser Ser Lys Val Ser Thr Val Lys Asp Leu 385 390 395 400	1200
ctg ccg ctg ctc gag aag gtc atc gga gcc ggt aag ccg ctg ctg atc Leu Pro Leu Leu Glu Lys Val Ile Gly Ala Gly Lys Pro Leu Leu Ile 405 410 415	1248
atc gcc gag gac gtc gag ggc gag gcg ctg tcc acc ctg gtc gtc aac Ile Ala Glu Asp Val Glu Gly Glu Ala Leu Ser Thr Leu Val Val Asn 420 425 430	1296
aag atc cgc ggc acc ttc aag tcg gtg gcg gtc aag gct ccc ggc ttc Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val Lys Ala Pro Gly Phe 435 440 445	1344

ggc gac cgc cgc aag gcg atg ctg cag gat atg gcc att ctc acc ggt Gly Asp Arg Arg Lys Ala Met Leu Gln Asp Met Ala Ile Leu Thr Gly 450 455 460	1392
ggt cag gtg atc agc gaa gag gtc ggc ctg acg ctg gag aac gcc gac Gly Gln Val Ile Ser Glu Glu Val Gly Leu Thr Leu Glu Asn Ala Asp 465 470 475 480	1440
ctg tcg ctg cta ggc aag gcc cgc aag gtc gtg gtc acc aag gac gag Leu Ser Leu Leu Gly Lys Ala Arg Lys Val Val Val Thr Lys Asp Glu 485 490 495	1488
acc acc atc gtc gag ggc gcc ggt gac acc gac gcc atc gcc gga cga Thr Thr Ile Val Glu Gly Ala Gly Asp Thr Asp Ala Ile Ala Gly Arg 500 505 510	1536
gtg gcc cag atc cgc cag gag atc gag aac agc gac tcc gac tac gac Val Ala Gln Ile Arg Gln Glu Ile Glu Asn Ser Asp Ser Asp Tyr Asp 515 520 525	1584
cgt gag aag ctg cag gag cgg ctg gcc aag ctg gcc ggt ggt gtc gcg Arg Glu Lys Leu Gln Glu Arg Leu Ala Lys Leu Ala Gly Gly Val Ala 530 535 540	1632
gtg atc aag gcc ggt gcc gcc acc gag gtc gaa ctc aag gag cgc aag Val Ile Lys Ala Gly Ala Ala Thr Glu Val Glu Leu Lys Glu Arg Lys 545 550 555 560	1680
cac cgc atc gag gat gcg gtt cgc aat gcc aag gcc gcc gtc gag gag His Arg Ile Glu Asp Ala Val Arg Asn Ala Lys Ala Ala Val Glu Glu 565 570 575	1728
ggc atc gtc gcc ggt ggg ggt gtg acg ctg ttg caa gcg gcc ccg acc Gly Ile Val Ala Gly Gly Gly Val Thr Leu Leu Gln Ala Ala Pro Thr 580 585 590	1776
ctg gac gag ctg aag ctc gaa ggc gac gag gcg acc ggc gcc aac atc Leu Asp Glu Leu Lys Leu Glu Gly Asp Glu Ala Thr Gly Ala Asn Ile 595 600 605	1824
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gcg gcg tcc atc gcg ggg ctg ttc ctg acc acc gag gcc gtc gtt gcc 2064  
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gac aag ccg gaa aag gag aag gct tcc gtt ccc ggt ggc ggc gac atg 2112  
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Gly Gly Met Asp Phe  
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<212> PRT
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Val	Glu	Leu	Leu	Ser	Phe	Leu	Pro	Ser	Asp	Phe	Phe	Pro	Ser	Val	Arg	
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Asp	Leu	Leu	Asp	Thr	Ala	Ser	Ala	Leu	Tyr	Arg	Glu	Ala	Leu	Glu	Ser	
	50					55					60					
Pro	Glu	His	Cys	Ser	Pro	His	His	Thr	Ala	Leu	Arg	Gln	Ala	Ile	Leu	
65					70					75					80	
Cys	Trp	Gly	Glu	Leu	Met	Thr	Leu	Ala	Thr	Trp	Val	Gly	Asn	Asn	Leu	
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Glu	Asp	Pro	Ala	Ser	Arg	Asp	Leu	Val	Val	Ser	Tyr	Val	Asn	Thr	Asn	
			100					105					110			
Met	Gly	Leu	Lys	Phe	Arg	Gln	Leu	Leu	Trp	Phe	His	Ile	Ser	Cys	Leu	
		115					120					125				
Thr	Phe	Gly	Arg	Glu	Thr	Val	Leu	Glu	Tyr	Leu	Val	Ser	Phe	Gly	Val	
	130					135					140					
Trp	Ile	Arg	Thr	Pro	Pro	Ala	Tyr	Arg	Pro	Pro	Asn	Ala	Pro	Ile	Leu	
145					150					155					160	
Ser	Thr	Leu	Pro	Glu	Thr	Thr	Val	Val	Asn	Ala	Lys	Thr	Ile	Ala	Tyr	
				165					170					175		
Asp	Glu	Glu	Ala	Arg	Arg	Gly	Leu	Glu	Arg	Gly	Leu	Asn	Ala	Leu	Ala	
			180					185					190			
Asp	Ala	Val	Lys	Val	Thr	Leu	Gly	Pro	Lys	Gly	Arg	Asn	Val	Val	Leu	
		195					200					205				
Glu	Lys	Lys	Trp	Gly	Ala	Pro	Thr	Ile	Thr	Asn	Asp	Gly	Val	Ser	Ile	
	210					215					220					
Ala	Lys	Glu	Ile	Glu	Leu	Glu	Asp	Pro	Tyr	Glu	Lys	Ile	Gly	Ala	Glu	
225					230					235					240	
Leu	Val	Lys	Glu	Val	Ala	Lys	Lys	Thr	Asp	Asp	Val	Ala	Gly	Asp	Gly	
				245					250					255		
Thr	Thr	Thr	Ala	Thr	Val	Leu	Ala	Gln	Ala	Leu	Val	Arg	Glu	Gly	Leu	
			260					265					270			

Arg	Asn	Val	Ala	Ala	Gly	Ala	Asn	Pro	Leu	Gly	Leu	Lys	Arg	Gly	Ile	275	280	285
Glu	Lys	Ala	Val	Glu	Lys	Val	Thr	Glu	Thr	Leu	Leu	Lys	Gly	Ala	Lys	290	295	300
Glu	Val	Glu	Thr	Lys	Glu	Gln	Ile	Ala	Ala	Thr	Ala	Ala	Ile	Ser	Ala	305	310	315
Gly	Asp	Gln	Ser	Ile	Gly	Asp	Leu	Ile	Ala	Glu	Ala	Met	Asp	Lys	Val	325	330	335
Gly	Asn	Glu	Gly	Val	Ile	Thr	Val	Glu	Glu	Ser	Asn	Thr	Phe	Gly	Leu	340	345	350
Gln	Leu	Glu	Leu	Thr	Glu	Gly	Met	Arg	Phe	Asp	Lys	Gly	Tyr	Ile	Ser	355	360	365
Gly	Tyr	Phe	Val	Thr	Asp	Pro	Glu	Arg	Gln	Glu	Ala	Val	Leu	Glu	Asp	370	375	380
Pro	Tyr	Ile	Leu	Leu	Val	Ser	Ser	Lys	Val	Ser	Thr	Val	Lys	Asp	Leu	385	390	395
Leu	Pro	Leu	Leu	Glu	Lys	Val	Ile	Gly	Ala	Gly	Lys	Pro	Leu	Leu	Ile	405	410	415
Ile	Ala	Glu	Asp	Val	Glu	Gly	Glu	Ala	Leu	Ser	Thr	Leu	Val	Val	Asn	420	425	430
Lys	Ile	Arg	Gly	Thr	Phe	Lys	Ser	Val	Ala	Val	Lys	Ala	Pro	Gly	Phe	435	440	445
Gly	Asp	Arg	Arg	Lys	Ala	Met	Leu	Gln	Asp	Met	Ala	Ile	Leu	Thr	Gly	450	455	460
Gly	Gln	Val	Ile	Ser	Glu	Glu	Val	Gly	Leu	Thr	Leu	Glu	Asn	Ala	Asp	465	470	475
Leu	Ser	Leu	Leu	Gly	Lys	Ala	Arg	Lys	Val	Val	Val	Thr	Lys	Asp	Glu	485	490	495
Thr	Thr	Ile	Val	Glu	Gly	Ala	Gly	Asp	Thr	Asp	Ala	Ile	Ala	Gly	Arg	500	505	510
Val	Ala	Gln	Ile	Arg	Gln	Glu	Ile	Glu	Asn	Ser	Asp	Ser	Asp	Tyr	Asp	515	520	525
Arg	Glu	Lys	Leu	Gln	Glu	Arg	Leu	Ala	Lys	Leu	Ala	Gly	Gly	Val	Ala	530	535	540
Val	Ile	Lys	Ala	Gly	Ala	Ala	Thr	Glu	Val	Glu	Leu	Lys	Glu	Arg	Lys	545	550	555
His	Arg	Ile	Glu	Asp	Ala	Val	Arg	Asn	Ala	Lys	Ala	Ala	Val	Glu	Glu	565	570	575
Gly	Ile	Val	Ala	Gly	Gly	Gly	Val	Thr	Leu	Leu	Gln	Ala	Ala	Pro	Thr	580	585	590
Leu	Asp	Glu	Leu	Lys	Leu	Glu	Gly	Asp	Glu	Ala	Thr	Gly	Ala	Asn	Ile	595	600	605
Val	Lys	Val	Ala	Leu	Glu	Ala	Pro	Leu	Lys	Gln	Ile	Ala	Phe	Asn	Ser	610	615	620
Gly	Leu	Glu	Pro	Gly	Val	Val	Ala	Glu	Lys	Val	Arg	Asn	Leu	Pro	Ala	625	630	635
Gly	His	Gly	Leu	Asn	Ala	Gln	Thr	Gly	Val	Tyr	Glu	Asp	Leu	Leu	Ala	645	650	655
Ala	Gly	Val	Ala	Asp	Pro	Val	Lys	Val	Thr	Arg	Ser	Ala	Leu	Gln	Asn	660	665	670
Ala	Ala	Ser	Ile	Ala	Gly	Leu	Phe	Leu	Thr	Thr	Glu	Ala	Val	Val	Ala	675	680	685
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Gly	Gly	Met	Asp	Phe												705		

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 Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp  
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 Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys  
 35 40 45

tca cct cac cac acc gca ctc agg caa gcc att ctc tgc tgg ggg gaa 192  
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu  
 50 55 60

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 Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala  
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tca agg gat cta gta gtc aat tat gtt aat act aac atg ggt tta aaa 288  
 Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys  
 85 90 95

ttt agg caa cta ttg tgg ttt cat ata tct tgc ctt act ttt gga aga 336  
 Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg  
 100 105 110

gag act gta ctt gaa tat ttg gta tct ttc gga gtg tgg att cgc act 384  
 Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr  
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 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro  
 130 135 140

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 Glu Thr Thr Val Val Arg Arg Ala Lys Thr Ile Ala Tyr Asp Glu Glu  
 145 150 155 160

gcc cgt cgc ggc ctc gag cgg ggc ttg aac gcc ctc gcc gat gcg gta 528  
 Ala Arg Arg Gly Leu Glu Arg Gly Leu Asn Ala Leu Ala Asp Ala Val  
 165 170 175



aag gtg aca ttg ggc ccc aag ggc cgc aac gtc gtc ctg gaa aag aag	576
Lys Val Thr Leu Gly Pro Lys Gly Arg Asn Val Val Leu Glu Lys Lys	
180 185 190	
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Trp Gly Ala Pro Thr Ile Thr Asn Asp Gly Val Ser Ile Ala Lys Glu	
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Ile Glu Leu Glu Asp Pro Tyr Glu Lys Ile Gly Ala Glu Leu Val Lys	
210 215 220	
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Glu Val Ala Lys Lys Thr Asp Asp Val Ala Gly Asp Gly Thr Thr Thr	
225 230 235 240	
gcc acc gtg ctg gcc cag gcg ttg gtt cgc gag ggc ctg cgc aac gtc	768
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245 250 255	
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Ala Ala Gly Ala Asn Pro Leu Gly Leu Lys Arg Gly Ile Glu Lys Ala	
260 265 270	
gtg gag aag gtc acc gag acc ctg ctc aag ggc gcc aag gag gtc gag	864
Val Glu Lys Val Thr Glu Thr Leu Leu Lys Gly Ala Lys Glu Val Glu	
275 280 285	
acc aag gag cag att gcg gcc acc gca gcg att tcg gcg ggt gac cag	912
Thr Lys Glu Gln Ile Ala Ala Thr Ala Ala Ile Ser Ala Gly Asp Gln	
290 295 300	
tcc atc ggt gac ctg atc gcc gag gcg atg gac aag gtg ggc aac gag	960
Ser Ile Gly Asp Leu Ile Ala Glu Ala Met Asp Lys Val Gly Asn Glu	
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ggc gtc atc acc gtc gag gag tcc aac acc ttt ggg ctg cag ctc gag	1008
Gly Val Ile Thr Val Glu Glu Ser Asn Thr Phe Gly Leu Gln Leu Glu	
325 330 335	
ctc acc gag ggt atg cgg ttc gac aag ggc tac atc tcg ggg tac ttc	1056
Leu Thr Glu Gly Met Arg Phe Asp Lys Gly Tyr Ile Ser Gly Tyr Phe	
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Val Thr Asp Pro Glu Arg Gln Glu Ala Val Leu Glu Asp Pro Tyr Ile	
355 360 365	
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Leu Leu Val Ser Ser Lys Val Ser Thr Val Lys Asp Leu Leu Pro Leu	
370 375 380	
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385 390 395 400	

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cgc aag gcg atg ctg cag gat atg gcc att ctc acc ggt ggt cag gtg Arg Lys Ala Met Leu Gln Asp Met Ala Ile Leu Thr Gly Gly Gln Val 435 440 445	1344
atc agc gaa gag gtc ggc ctg acg ctg gag aac gcc gac ctg tcg ctg Ile Ser Glu Glu Val Gly Leu Thr Leu Glu Asn Ala Asp Leu Ser Leu 450 455 460	1392
cta ggc aag gcc cgc aag gtc gtg gtc acc aag gac gag acc acc atc Leu Gly Lys Ala Arg Lys Val Val Val Thr Lys Asp Glu Thr Thr Ile 465 470 475 480	1440
gtc gag ggc gcc ggt gac acc gac gcc atc gcc gga cga gtg gcc cag Val Glu Gly Ala Gly Asp Thr Asp Ala Ile Ala Gly Arg Val Ala Gln 485 490 495	1488
atc cgc cag gag atc gag aac agc gac tcc gac tac gac cgt gag aag Ile Arg Gln Glu Ile Glu Asn Ser Asp Ser Asp Tyr Asp Arg Glu Lys 500 505 510	1536
ctg cag gag cgg ctg gcc aag ctg gcc ggt ggt gtc gcg gtg atc aag Leu Gln Glu Arg Leu Ala Lys Leu Ala Gly Gly Val Ala Val Ile Lys 515 520 525	1584
gcc ggt gcc gcc acc gag gtc gaa ctc aag gag cgc aag cac cgc atc Ala Gly Ala Ala Thr Glu Val Glu Leu Lys Glu Arg Lys His Arg Ile 530 535 540	1632
gag gat gcg gtt cgc aat gcc aag gcc gcc gtc gag gag ggc atc gtc Glu Asp Ala Val Arg Asn Ala Lys Ala Ala Val Glu Glu Gly Ile Val 545 550 555 560	1680
gcc ggt ggg ggt gtg acg ctg ttg caa gcg gcc ccg acc ctg gac gag Ala Gly Gly Gly Val Thr Leu Leu Gln Ala Ala Pro Thr Leu Asp Glu 565 570 575	1728
ctg aag ctc gaa ggc gac gag gcg acc ggc gcc aac atc gtg aag gtg Leu Lys Leu Glu Gly Asp Glu Ala Thr Gly Ala Asn Ile Val Lys Val 580 585 590	1776
gcg ctg gag gcc ccg ctg aag cag atc gcc ttc aac tcc ggg ctg gag Ala Leu Glu Ala Pro Leu Lys Gln Ile Ala Phe Asn Ser Gly Leu Glu 595 600 605	1824
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gct gac ccg gtc aag gtg acc cgt tcg gcg	ctg cag aat gcg gcg tcc	1968
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Ile Ala Gly Leu Phe Leu Thr Thr Glu	Ala Val Val Ala Asp Lys Pro	
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gaa aag gag aag gct tcc gtt ccc ggt ggc	ggc gac atg ggt ggc atg	2064
Glu Lys Glu Lys Ala Ser Val Pro Gly	Gly Gly Asp Met Gly Gly Met	
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gat ttc tga	2073
Asp Phe	
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&lt;211&gt; 690

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Fusion protein

&lt;400&gt; 10

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Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu	Glu Ser Pro Glu His Cys
	35 40 45
Ser Pro His His Thr Ala Leu Arg Gln Ala	Ile Leu Cys Trp Gly Glu
	50 55 60
Leu Met Thr Leu Ala Thr Trp Val Gly Asn	Asn Leu Glu Asp Pro Ala
	65 70 75 80
Ser Arg Asp Leu Val Val Asn Tyr Val Asn	Thr Asn Met Gly Leu Lys
	85 90 95
Phe Arg Gln Leu Leu Trp Phe His Ile Ser	Cys Leu Thr Phe Gly Arg
	100 105 110
Glu Thr Val Leu Glu Tyr Leu Val Ser Phe	Gly Val Trp Ile Arg Thr
	115 120 125
Pro Pro Ala Tyr Arg Pro Pro Asn Ala	Pro Ile Leu Ser Thr Leu Pro
	130 135 140
Glu Thr Thr Val Val Arg Arg Ala Lys Thr	Ile Ala Tyr Asp Glu Glu
	145 150 155 160
Ala Arg Arg Gly Leu Glu Arg Gly Leu Asn	Ala Leu Ala Asp Ala Val
	165 170 175
Lys Val Thr Leu Gly Pro Lys Gly Arg Asn	Val Val Leu Glu Lys Lys
	180 185 190
Trp Gly Ala Pro Thr Ile Thr Asn Asp Gly	Val Ser Ile Ala Lys Glu
	195 200 205

Ile	Glu	Leu	Glu	Asp	Pro	Tyr	Glu	Lys	Ile	Gly	Ala	Glu	Leu	Val	Lys
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Glu	Val	Ala	Lys	Lys	Thr	Asp	Asp	Val	Ala	Gly	Asp	Gly	Thr	Thr	Thr
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				245					250					255	
Ala	Ala	Gly	Ala	Asn	Pro	Leu	Gly	Leu	Lys	Arg	Gly	Ile	Glu	Lys	Ala
			260				265						270		
Val	Glu	Lys	Val	Thr	Glu	Thr	Leu	Leu	Lys	Gly	Ala	Lys	Glu	Val	Glu
	275						280				285				
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Ser	Ile	Gly	Asp	Leu	Ile	Ala	Glu	Ala	Met	Asp	Lys	Val	Gly	Asn	Glu
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Gly	Val	Ile	Thr	Val	Glu	Glu	Ser	Asn	Thr	Phe	Gly	Leu	Gln	Leu	Glu
				325					330					335	
Leu	Thr	Glu	Gly	Met	Arg	Phe	Asp	Lys	Gly	Tyr	Ile	Ser	Gly	Tyr	Phe
			340				345						350		
Val	Thr	Asp	Pro	Glu	Arg	Gln	Glu	Ala	Val	Leu	Glu	Asp	Pro	Tyr	Ile
		355					360					365			
Leu	Leu	Val	Ser	Ser	Lys	Val	Ser	Thr	Val	Lys	Asp	Leu	Leu	Pro	Leu
370					375					380					
Leu	Glu	Lys	Val	Ile	Gly	Ala	Gly	Lys	Pro	Leu	Leu	Ile	Ile	Ala	Glu
385				390						395					400
Asp	Val	Glu	Gly	Glu	Ala	Leu	Ser	Thr	Leu	Val	Val	Asn	Lys	Ile	Arg
				405					410					415	
Gly	Thr	Phe	Lys	Ser	Val	Ala	Val	Lys	Ala	Pro	Gly	Phe	Gly	Asp	Arg
			420					425					430		
Arg	Lys	Ala	Met	Leu	Gln	Asp	Met	Ala	Ile	Leu	Thr	Gly	Gly	Gln	Val
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Ile	Ser	Glu	Glu	Val	Gly	Leu	Thr	Leu	Glu	Asn	Ala	Asp	Leu	Ser	Leu
	450				455					460					
Leu	Gly	Lys	Ala	Arg	Lys	Val	Val	Val	Thr	Lys	Asp	Glu	Thr	Thr	Ile
465					470					475					480
Val	Glu	Gly	Ala	Gly	Asp	Thr	Asp	Ala	Ile	Ala	Gly	Arg	Val	Ala	Gln
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Ile	Arg	Gln	Glu	Ile	Glu	Asn	Ser	Asp	Ser	Asp	Tyr	Asp	Arg	Glu	Lys
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Leu	Gln	Glu	Arg	Leu	Ala	Lys	Leu	Ala	Gly	Gly	Val	Ala	Val	Ile	Lys
	515						520					525			
Ala	Gly	Ala	Ala	Thr	Glu	Val	Glu	Leu	Lys	Glu	Arg	Lys	His	Arg	Ile
	530				535					540					
Glu	Asp	Ala	Val	Arg	Asn	Ala	Lys	Ala	Ala	Val	Glu	Glu	Gly	Ile	Val
545					550					555					560
Ala	Gly	Gly	Gly	Val	Thr	Leu	Leu	Gln	Ala	Ala	Pro	Thr	Leu	Asp	Glu
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Leu	Lys	Leu	Glu	Gly	Asp	Glu	Ala	Thr	Gly	Ala	Asn	Ile	Val	Lys	Val
			580				585						590		
Ala	Leu	Glu	Ala	Pro	Leu	Lys	Gln	Ile	Ala	Phe	Asn	Ser	Gly	Leu	Glu
	595						600					605			
Pro	Gly	Val	Val	Ala	Glu	Lys	Val	Arg	Asn	Leu	Pro	Ala	Gly	His	Gly
	610					615				620					
Leu	Asn	Ala	Gln	Thr	Gly	Val	Tyr	Glu	Asp	Leu	Leu	Ala	Ala	Gly	Val
625					630					635					640
Ala	Asp	Pro	Val	Lys	Val	Thr	Arg	Ser	Ala	Leu	Gln	Asn	Ala	Ala	Ser
				645					650					655	

Ile Ala Gly Leu Phe Leu Thr Thr Glu Ala Val Val Ala Asp Lys Pro  
                   660                  665                  670  
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tcg ttt ttg cct tct gac ttc ttt cct tcc gtc aga gat ctc cta gac 96  
 Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp  
                   20                  25                  30

acc gcc tca gct ctg tat cgg gaa gcc tta gag tct cct gag cat tgc 144  
 Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys  
                   35                  40                  45

tca cct cac cac acc gca ctc agg caa gcc att ctc tgc tgg ggg gaa 192  
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu  
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ttg atg act cta gct acc tgg gtg ggt aat aat ttg gaa gat cca gca 240  
 Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala  
                   65                  70                  75                  80

tca agg gat cta gta gtc aat tat gtt aat act aac atg ggt tta aaa 288  
 Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys  
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ttt agg caa cta ttg tgg ttt cat ata tct tgc ctt act ttt gga aga 336  
 Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg  
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gag act gta ctt gaa tat ttg gta tct ttc gga gtg tgg att cgc act 384  
 Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr  
                   115                  120                  125

cct cca gcc tat aga cca cca aat gcc cct atc tta tca aca ctt ccg 432  
 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro  
                   130                  135                  140

gaa act act gtt gtt aga cga cgg gac cga ggc agg tcc cct aga aga 480  
 Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg  
                   145                  150                  155                  160

aga act ccc tcg cct cgc aga cgc aga tct caa tcg ccg cgt cgc aga	528
Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg	
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Arg Ser Gln Ser Arg Glu Ser Gln Cys Ala Lys Thr Ile Ala Tyr Asp	
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gaa gag gcc cgt cgc ggc ctc gag cgg ggc ttg aac gcc ctc gcc gat	624
Glu Glu Ala Arg Arg Gly Leu Glu Arg Gly Leu Asn Ala Leu Ala Asp	
195 200 205	
gcg gta aag gtg aca ttg ggc ccc aag ggc cgc aac gtc gtc ctg gaa	672
Ala Val Lys Val Thr Leu Gly Pro Lys Gly Arg Asn Val Val Leu Glu	
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Lys Lys Trp Gly Ala Pro Thr Ile Thr Asn Asp Gly Val Ser Ile Ala	
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Lys Glu Ile Glu Leu Glu Asp Pro Tyr Glu Lys Ile Gly Ala Glu Leu	
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gtc aaa gag gta gcc aag aag acc gat gac gtc gcc ggt gac ggc acc	816
Val Lys Glu Val Ala Lys Lys Thr Asp Asp Val Ala Gly Asp Gly Thr	
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Thr Thr Ala Thr Val Leu Ala Gln Ala Leu Val Arg Glu Gly Leu Arg	
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aac gtc gcg gcc ggc gcc aac ccg ctc ggt ctc aaa cgc ggc atc gaa	912
Asn Val Ala Ala Gly Ala Asn Pro Leu Gly Leu Lys Arg Gly Ile Glu	
290 295 300	
aag gcc gtg gag aag gtc acc gag acc ctg ctc aag ggc gcc aag gag	960
Lys Ala Val Glu Lys Val Thr Glu Thr Leu Leu Lys Gly Ala Lys Glu	
305 310 315 320	
gtc gag acc aag gag cag att gcg gcc acc gca gcg att tcg gcg ggt	1008
Val Glu Thr Lys Glu Gln Ile Ala Ala Thr Ala Ala Ile Ser Ala Gly	
325 330 335	
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Asp Gln Ser Ile Gly Asp Leu Ile Ala Glu Ala Met Asp Lys Val Gly	
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Asn Glu Gly Val Ile Thr Val Glu Glu Ser Asn Thr Phe Gly Leu Gln	
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Leu Glu Leu Thr Glu Gly Met Arg Phe Asp Lys Gly Tyr Ile Ser Gly	
370 375 380	

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ccg ctg ctc gag aag gtc atc gga gcc ggt aag ccg ctg ctg atc atc Pro Leu Leu Glu Lys Val Ile Gly Ala Gly Lys Pro Leu Leu Ile Ile 420 425 430	1296
gcc gag gac gtc gag gcc gag gcg ctg tcc acc ctg gtc gtc aac aag Ala Glu Asp Val Glu Gly Glu Ala Leu Ser Thr Leu Val Val Asn Lys 435 440 445	1344
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atc gtc gcc ggt ggg ggt gtg acg ctg ttg caa gcg gcc ccg acc ctg Ile Val Ala Gly Gly Gly Val Thr Leu Leu Gln Ala Ala Pro Thr Leu 595 600 605	1824

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ctg gag ccg ggc gtg gtg gcc gag aag gtg cgc aac ctg ccg gct ggc Leu Glu Pro Gly Val Val Ala Glu Lys Val Arg Asn Leu Pro Ala Gly 645 650 655	1968
cac gga ctg aac gct cag acc ggt gtc tac gag gat ctg ctc gct gcc His Gly Leu Asn Ala Gln Thr Gly Val Tyr Glu Asp Leu Leu Ala Ala 660 665 670	2016
ggc gtt gct gac ccg gtc aag gtg acc cgt tcg gcg ctg cag aat gcg Gly Val Ala Asp Pro Val Lys Val Thr Arg Ser Ala Leu Gln Asn Ala 675 680 685	2064
gcg tcc atc gcg ggg ctg ttc ctg acc acc gag gcc gtc gtt gcc gac Ala Ser Ile Ala Gly Leu Phe Leu Thr Thr Glu Ala Val Val Ala Asp 690 695 700	2112
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 Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys  
 35 40 45  
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu  
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 Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala  
 65 70 75 80  
 Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys  
 85 90 95  
 Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg  
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Glu	Thr	Val	Leu	Glu	Tyr	Leu	Val	Ser	Phe	Gly	Val	Trp	Ile	Arg	Thr	115	120	125
Pro	Pro	Ala	Tyr	Arg	Pro	Pro	Asn	Ala	Pro	Ile	Leu	Ser	Thr	Leu	Pro	130	135	140
Glu	Thr	Thr	Val	Val	Arg	Arg	Arg	Asp	Arg	Gly	Arg	Ser	Pro	Arg	Arg	145	150	155
Arg	Thr	Pro	Ser	Pro	Arg	Arg	Arg	Arg	Ser	Gln	Ser	Pro	Arg	Arg	Arg	165	170	175
Arg	Ser	Gln	Ser	Arg	Glu	Ser	Gln	Cys	Ala	Lys	Thr	Ile	Ala	Tyr	Asp	180	185	190
Glu	Glu	Ala	Arg	Arg	Gly	Leu	Glu	Arg	Gly	Leu	Asn	Ala	Leu	Ala	Asp	195	200	205
Ala	Val	Lys	Val	Thr	Leu	Gly	Pro	Lys	Gly	Arg	Asn	Val	Val	Leu	Glu	210	215	220
Lys	Lys	Trp	Gly	Ala	Pro	Thr	Ile	Thr	Asn	Asp	Gly	Val	Ser	Ile	Ala	225	230	235
Lys	Glu	Ile	Glu	Leu	Glu	Asp	Pro	Tyr	Glu	Lys	Ile	Gly	Ala	Glu	Leu	245	250	255
Val	Lys	Glu	Val	Ala	Lys	Lys	Thr	Asp	Asp	Val	Ala	Gly	Asp	Gly	Thr	260	265	270
Thr	Thr	Ala	Thr	Val	Leu	Ala	Gln	Ala	Leu	Val	Arg	Glu	Gly	Leu	Arg	275	280	285
Asn	Val	Ala	Ala	Gly	Ala	Asn	Pro	Leu	Gly	Leu	Lys	Arg	Gly	Ile	Glu	290	295	300
Lys	Ala	Val	Glu	Lys	Val	Thr	Glu	Thr	Leu	Leu	Lys	Gly	Ala	Lys	Glu	305	310	315
Val	Glu	Thr	Lys	Glu	Gln	Ile	Ala	Ala	Thr	Ala	Ala	Ile	Ser	Ala	Gly	325	330	335
Asp	Gln	Ser	Ile	Gly	Asp	Leu	Ile	Ala	Glu	Ala	Met	Asp	Lys	Val	Gly	340	345	350
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Tyr	Phe	Val	Thr	Asp	Pro	Glu	Arg	Gln	Glu	Ala	Val	Leu	Glu	Asp	Pro	385	390	395
Tyr	Ile	Leu	Leu	Val	Ser	Ser	Lys	Val	Ser	Thr	Val	Lys	Asp	Leu	Leu	405	410	415
Pro	Leu	Leu	Glu	Lys	Val	Ile	Gly	Ala	Gly	Lys	Pro	Leu	Leu	Ile	Ile	420	425	430
Ala	Glu	Asp	Val	Glu	Gly	Glu	Ala	Leu	Ser	Thr	Leu	Val	Val	Asn	Lys	435	440	445
Ile	Arg	Gly	Thr	Phe	Lys	Ser	Val	Ala	Val	Lys	Ala	Pro	Gly	Phe	Gly	450	455	460
Asp	Arg	Arg	Lys	Ala	Met	Leu	Gln	Asp	Met	Ala	Ile	Leu	Thr	Gly	Gly	465	470	475
Gln	Val	Ile	Ser	Glu	Glu	Val	Gly	Leu	Thr	Leu	Glu	Asn	Ala	Asp	Leu	485	490	495
Ser	Leu	Leu	Gly	Lys	Ala	Arg	Lys	Val	Val	Val	Thr	Lys	Asp	Glu	Thr	500	505	510
Thr	Ile	Val	Glu	Gly	Ala	Gly	Asp	Thr	Asp	Ala	Ile	Ala	Gly	Arg	Val	515	520	525
Ala	Gln	Ile	Arg	Gln	Glu	Ile	Glu	Asn	Ser	Asp	Ser	Asp	Tyr	Asp	Arg	530	535	540
Glu	Lys	Leu	Gln	Glu	Arg	Leu	Ala	Lys	Leu	Ala	Gly	Gly	Val	Ala	Val	545	550	555

